

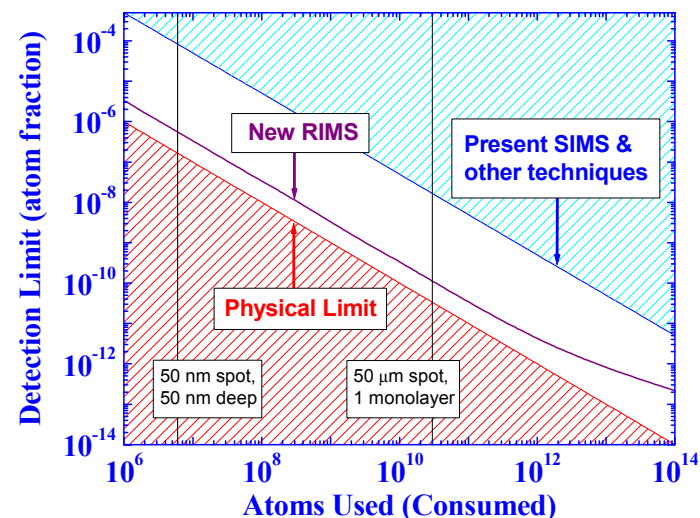
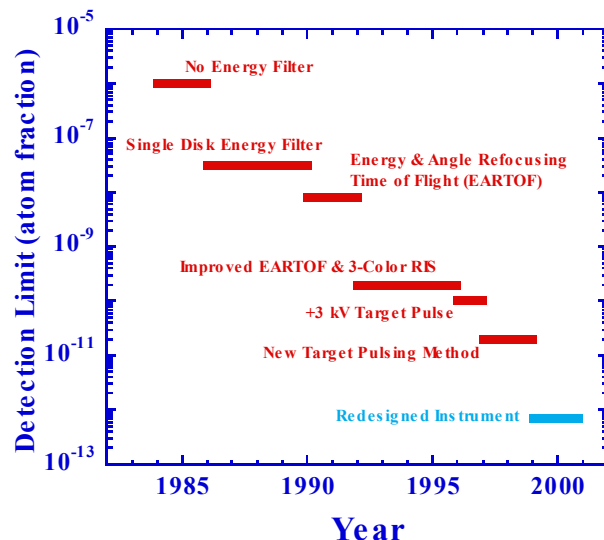
Detecting an Atom of One Element in a Trillion Other Atoms

Researches at ANL have developed a new time-of-flight mass spectrometer for use in resonance ionization mass spectrometry (RIMS).

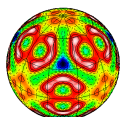
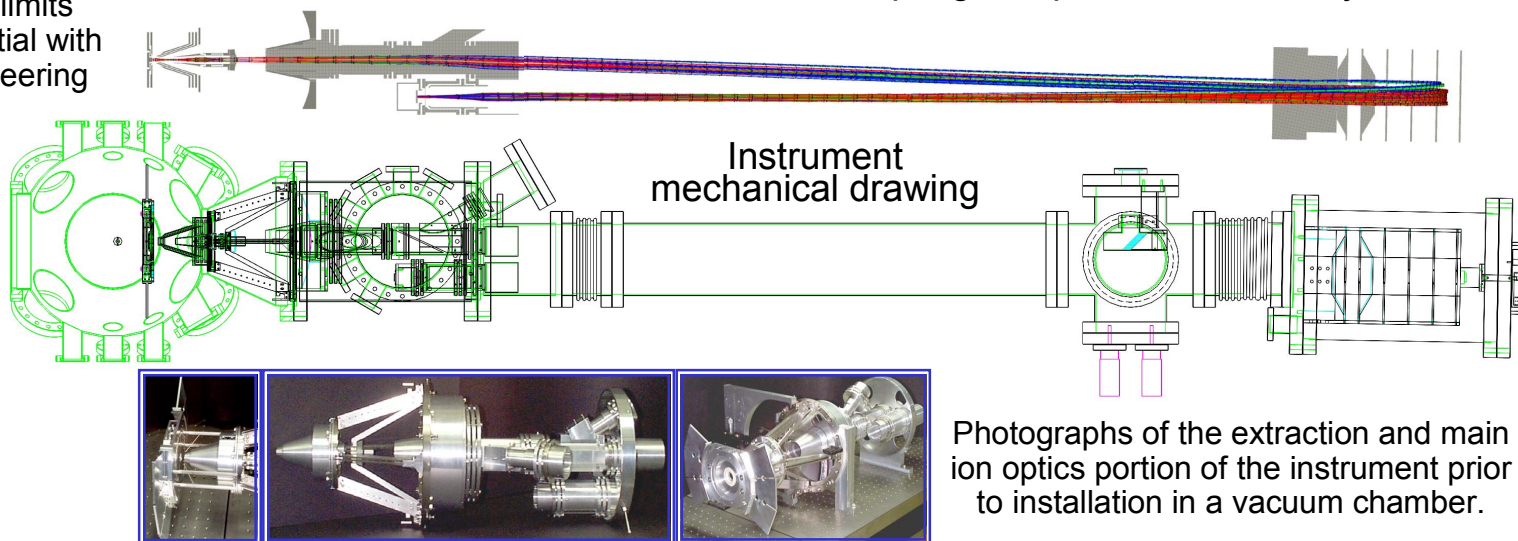
The high sensitivity of the new instrument allows ppt (10^{-12}) measurements while consuming minimal sample. As shown in the graph on the right, the new instrument has improved sensitivity over other techniques, such as SIMS, and approaches the physical limit below which there is insufficient material for making measurements.

As shown in the graph in the center, RIMS detection limits have improved substantial with time at ANL due to pioneering research.

The new RIMS instrument shown on the right is unsurpassed for trace analysis applications on samples with limited dimensions, such as nanoparticles and surfaces.



Computer simulation used to track the path of photoions through the instrument used to develop highest possible sensitivity.



Basic Energy Sciences



Argonne National Laboratory

Surface Chemistry
Group (58600)